Fungi

BIO162 Fall 07 D. Page Baluch

Fungi		
KINGDOM NAME	KEY CHARACTERISTICS	EXAMPLES
MONERA	UNICELLULAR PROKARYOTIC	BACTERIA BLUE-GREEN ALGAE
PROTISTA	MOSTLY UNICELLULAR EUKARYOTIC MOSTLY FREE-LIVING, SOME COLONIAL	AMEOBA PARAMECIUM EUGLENA ALGAE
FUNGI	MOSTLY MULTICELLULAR EUKARYOTIC HETEROTROPHIC (Feed off other organisms) SESSILE	MUSHROOMS MOLDS & MILDEWS YEAST (unicellular)
PLANTAE	MULTICELLULAR EUKARYOTIC AUTOTROPHIC SESSILE CELL WALLS made of CELLULOSE	MOSS FERNS FLOWERING PLANTS BUSHES TREES
ANIMALIA	MULTICELLULAR EUKARYOTIC HETEROTROPHIC MOTILE SPECIALIZED SENSE ORGANS	INSECTS JELLYFISH, HYDRA CRABS FISH BIRDS LIONS,TIGERS,BEARS



Fungi

- Includes molds, mildew, yeast, mushrooms, athletes foot
- Important in breaking down dead organic matter so nutrients can be recycled
- Many drugs obtained from fungi (Penicillin)
- Some cause plant and animal diseases (ringworm, athletes foot, valley fever)
- Fungal diseases difficult to treat

Characteristics of fungi

- Have cellular features of eukaryotic cells
- Cell wall is made of chitin (vs. cellulose in plant)
- Nutrition mode
 - Heterotrophs (non-photosynthetic)
 - Some are saprophyte secret enzymes to decompose organic matter of dead organisms
 - Some are haustoria obtain nutrients from living host





- Molds and mushrooms are made of strands called hyphae
- A mass of hyphae is called mycelium.
- Multicellular hyphae that have separate cells are called **septate**
- Multinuclear hyphae that have no divisions between nuclei are called **coenocytic**









Reproduction of Fungi

•Asexual – budding (yeast), lightweight spores (filamentous)

•Sexual – sexual spores of the two sexual types fuse and involve exchanges of genetic material





Asexual spore formation in filamentous fungi

- Sporangiospore (sac)
- Chlamydospore (hyphae)
- Conidiospore (no sac)







The Four division (phyla) of fungi

• Zygomycota

- ~1100 species (most are saprophytes; some are parasites of insects)
- Asexually reproduce by sporangiospores
- Common black molds seen on bread, vegetables etc. e.g. Rhizopus
- Some are known to cause disease in immunocompromised patients



The Four division (phyla) of fungi

Ascomycota

- ~32000 species of yeast and mold
- Asexually reproduce by conidiospores



- Saccharomyces
- truffles
- and the bad
 - Spoil food
 - Plant pathogens
 - Claviceps purpurea



The Four division (phyla) of fungi

Basidiomycota

- ~22000 species of fleshy mushroom (fruiting body of fungus)



Deuteromycetes

- sexual reproduction unknown
- Trichophyton (cause ringworm)



Fungal infection (Mycoses)

- · Generally mild & limiting
- Once go pass the skin protection, could be severe infection •
 - 1. Superficial limited to outermost layer of skin and hair Suberricial – ininited to outermost rayer of skin and nair
 Cutaneous (ringworm or tinea) caused by dermatophytes (*Microsporum* sp. *Trichophyton* sp. *Epidermophyton* sp.)
 Sub-cutaneous – e.g. Madura foot, may required surgical intervention

 - Systemic inhalation of spores e.g. infection of lung tissue by Aspergillus fumigatus; bread mold
 Opportunistics A. fumigatus, Candida albicans

Toxin produced by fungi (Mycotoxins)

- · Some fungi produce toxins and cause mycotoxicoses
- Ergot poisoning (Claviceps purpurea) capillaries degeneration and neurological impairment
- Carcinogenic (Aspergillus flavus)

Antifungal agent

- Destroy cell wall (chitin)
- Block DNA, protein or cell membrane synthesis